



**Ewbank
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**Thermal Conductivity Test Results
Cloudland School
Roan Mountain, Tennessee**

Earth Energy Engineering performed a thermal conductivity test at the Cloudland School in Roan Mountain, Tennessee on June 9, 1999. Testing was done by Bill Nagle with a Ewbank portable test unit.

The test borehole was 300 feet in depth and 6" in diameter. A 1" inch loop was installed and the borehole was backfilled with #8 stone. Static water level was reported at 70 feet. The formations encountered were primarily ~~limestone~~
shale.

The graph of the power input for this test shows a stable power supply for the test.

The thermal conductivity (k) value for this borehole is **1.85 btu/degree F-hr-foot**. This is an average conductivity per foot for the borehole. This value represents the rate at which the borehole and rock will transfer heat. To accurately measure the thermal conductivity of the formation a borehole should be drilled and grout with a bentonite grout to prevent any flow of water through the borehole.

All test equipment, methods, procedures, calculations, and interpretation is done in accordance with the recommendations and guidelines of the International Ground Source Heat Pump Association.

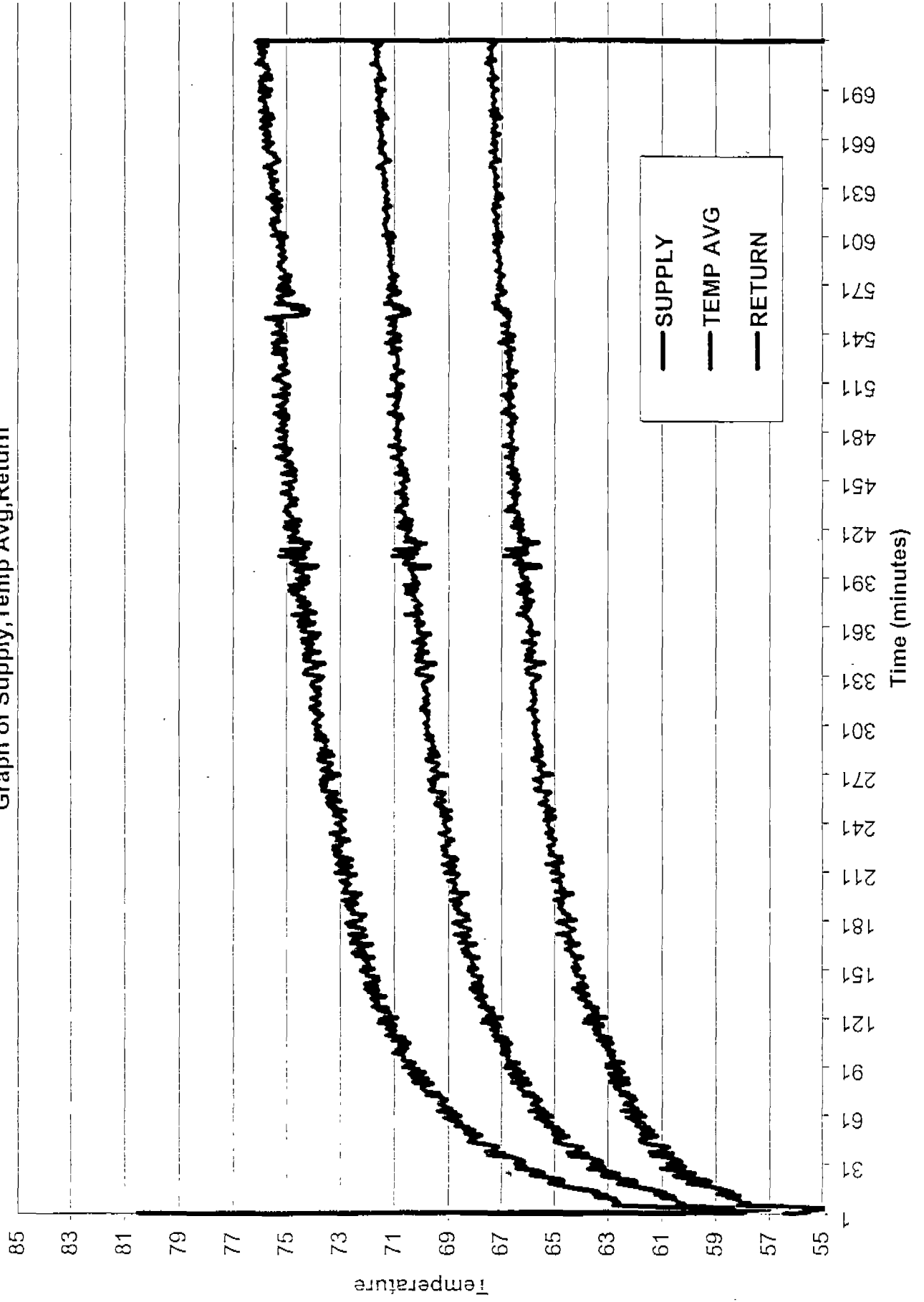
Drill Log for Cloudland School Site

Hole # 1

42 ft steel & 19 ft PVC casing left in place

From ft	To ft	Material	GPM
0	40	Clay	
40	300	Shale	60

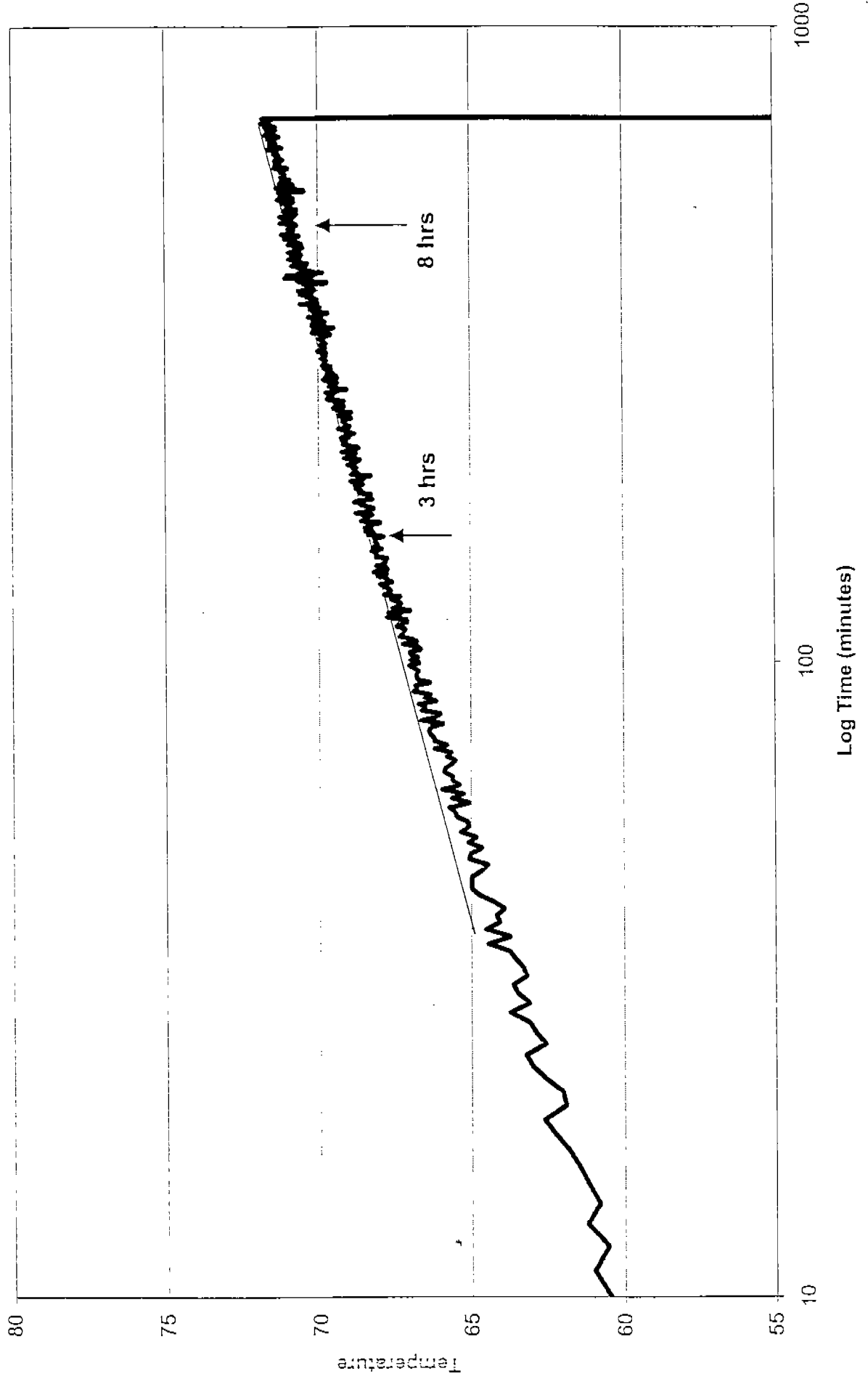
Cloudland High School
Thermal Test
Graph of Supply, Temp Avg, Return



Cloudland High School

Thermal Test

Graph of Log Time of Temp Avg



Cloudland High School
Thermal Test
Graph of Wattage

